

Amendments to the Claims

- 1-121. (Cancelled).
122. (Previously Presented) Purified cage molecules consisting of carbon atoms.
123. (Previously Presented) Purified cage molecules consisting of carbon atoms in solid form.
124. (Previously Presented) Crystalline cage molecules consisting of carbon atoms.
125. (Previously Presented) Purified cage molecules consisting of carbon atoms in crystalline form.
126. (Previously Presented) A macroscopic amount of purified cage molecules consisting of carbon atoms.
127. (Previously Presented) A product comprising a cage moiety consisting of carbon atoms.
128. (Previously Presented) A product comprising cage molecules consisting of carbon atoms soluble in non-polar organic solvents.
129. (Previously Presented) A free-flowing particulate comprising cage molecules consisting of carbon atoms soluble in non-polar organic solvents.
130. (Previously Presented) A free-flowing particulate comprising cage molecules consisting of carbon atoms in microcrystalline form.
131. (Previously Presented) A solid comprising a macroscopic amount of cage molecules consisting of carbon atoms in crystalline form.
132. (Previously Presented) A solid comprising a macroscopic amount of cage molecules consisting of carbon atoms soluble in non-polar organic solvents.
133. (Previously Presented) A solid carbon product prepared by the process comprising: (a) vaporizing a carbon source in the presence of an inert quenching gas under conditions effective to provide a sooty carbon product comprising cage molecules; (b) depositing the sooty carbon

product on a collecting substrate; (c) removing the sooty carbon product from the collecting substrate; (d) contacting the sooty carbon product with a non-polar organic solvent effective to dissolve cage molecules, said solvent being present in an amount effective to dissolve the cage molecules in said sooty carbon product; and (e) recovering from said resulting product formed when the sooty carbon product was contacted with said solvent a solid carbon product comprising cage in a macroscopic amount.

134. (Previously Presented) The solid carbon product of claim 133 in which the carbon in step (a) is vaporized in an evacuated reactor.

135. (Previously Presented) The solid carbon product of claim 134 in which the carbon source of step (a) is vaporized in an evacuated bell jar.

136. (Previously Presented) The solid carbon product of claim 133 in which the carbon source subject to vaporization in step (a) is graphite.

137. (Previously Presented) The solid carbon product of claim 133 in which the carbon source subject to vaporization in step (a) is graphite rods.

138. (Previously Presented) The solid carbon product of claim 133 wherein the carbon source is vaporized in step (a) through heating the carbon source by means of an electrical current of sufficient intensity to produce the sooty carbon product.

139. (Previously Presented) The solid carbon product of claim 138 wherein the electrical current is about 100 amps.

140. (Previously Presented) The solid carbon product of claim 133 wherein the inert quenching gas of step (a) is a noble gas.

141. (Previously Presented) The solid carbon product of claim 133 wherein the carbon source is vaporized in step (a) at a pressure ranging from 50 torr to 400 torr.

142. (Previously Presented) The solid carbon product of claim 141 wherein the carbon is vaporized in step (a) at approximately 100 torr.
143. (Previously Presented) The solid carbon product of claim 133 wherein the carbon is vaporized in step (a) at a pressure ranging from about 2 to 3 atmospheres.
144. (Previously Presented) The solid carbon product of claim 133 wherein the collecting substrate in step (b) is a glass surface.
145. (Previously Presented) The solid carbon product of claim 140 wherein the inert gas is helium or argon.
146. (Previously Presented) The solid carbon product of claim 133 wherein the non-polar organic solvent of step (d) is carbon disulfide, benzene, carbon tetrachloride or toluene.
147. (Previously Presented) The solid carbon product of claim 146 wherein the solvent is benzene.
148. (Previously Presented) The solid carbon product of claim 146 wherein the solvent is carbon tetrachloride.
149. (Previously Presented) The solid carbon product of claim 133 wherein recovery step (e) comprises evaporating the solvent.
150. (Previously Presented) A solid carbon product prepared by the process comprising: (a) evaporating a carbon source in the presence of an inert quenching gas under conditions effective to produce a sooty carbon product containing cage molecules, said cage molecules being present in said sooty carbon product in sufficient concentration to allow a macroscopic amount of said cage molecules to be separated from said sooty product; (b) collecting the sooty carbon product produced therefrom; (c) subliming the carbon product comprising cage molecules from the sooty carbon product; and (d) condensing the sublimed carbon product comprising cage molecules.

151. (Previously Presented) The solid carbon product of claim 150, wherein the collecting substrate in step (b) is a glass surface.
152. (Previously Presented) The solid carbon product of claim 150 wherein the sublimation occurs at a temperature ranging from 100°-500° C.
153. (Previously Presented) The solid carbon product of claim 152 wherein step (c) comprises heating the carbon product comprising cage molecules in a vacuum or inert atmosphere at effective sublimation temperatures to extract the carbon product comprising cage molecules from said sooty carbon product.
154. (Previously Presented) The solid carbon product of claim 150 in which the carbon source in step (a) is vaporized in an evacuated reactor.
155. (Previously Presented) The solid carbon product of claim 154 in which the carbon in step (a) is vaporized in an evacuated bell jar.
156. (Previously Presented) The solid carbon product of claim 150 in which the carbon subject to vaporization in step (a) is graphite.
157. (Previously Presented) The solid carbon product of claim 150 in which the carbon subject to vaporization in step (a) is graphite rods.
158. (Previously Presented) The solid carbon product of claim 150, wherein the carbon source in step (a) is vaporized by passing an electric current of sufficient intensity to produce a sooty carbon product.
159. (Previously Presented) The solid carbon product of claim 158, wherein the electrical current is about 100 amps.
160. (Previously Presented) The solid carbon product of claim 150, wherein the inert quenching gas of step (a) is a noble gas.

161. (Previously Presented) The solid carbon product of claim 150, wherein the carbon source in step (a) is vaporized at a pressure ranging from 50 torr to 400 torr.

162. (Previously Presented) The solid carbon product of claim 161, wherein the carbon source is vaporized in step (a) at approximately 100 torr.

163. (Previously Presented) The solid carbon product of claim 160, wherein the noble gas is helium or argon.

164. (New) Purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

165. (New) Purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in solid form.

166. (New) Crystalline cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

167. (New) Purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in crystalline form.

168. (New) A macroscopic amount of purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

169. (New) A free-flowing particulate comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in microcrystalline form.

170. (New) A solid comprising a macroscopic amount of cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in crystalline form.

171. (New) A solid carbon product prepared by the process comprising:

(a) vaporizing a carbon source in the presence of an inert quenching gas under conditions effective to provide a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents;

(b) depositing the sooty carbon product on a collecting substrate;

(c) removing the sooty carbon product from the collecting substrate;

(d) contacting the sooty carbon product with a non-polar organic solvent effective to dissolve said cage molecules, said solvent being present in an amount effective to dissolve the cage molecules in said sooty carbon product; and

(e) recovering from said resulting product formed when the sooty carbon product was contacted with said solvent a solid carbon product comprising said cage molecules in a macroscopic amount.

172. (New) The solid carbon product of claim 171 in which the carbon in step (a) is vaporized in an evacuated reactor.

173. (New) The solid carbon product of claim 172 in which the carbon source of step (a) is vaporized in an evacuated bell jar.

174. (New) The solid carbon product of claim 171 in which the carbon source subject to vaporization in step (a) is graphite.

175. (New) The solid carbon product of claim 171 in which the carbon source subject to vaporization in step (a) is graphite rods.

176. (New) The solid carbon product of claim 171 wherein the carbon source is vaporized in step (a) through heating the carbon source by means of an electrical current of sufficient intensity to produce the sooty carbon product.

177. (New) The solid carbon product of claim 176 wherein the electrical current is about 100 amps.
178. (New) The solid carbon product of claim 171 wherein the inert quenching gas of step (a) is a noble gas.
179. (New) The solid carbon product of claim 171 wherein the carbon source is vaporized in step (a) at a pressure ranging from 50 torr to 400 torr.
180. (New) The solid carbon product of claim 179 wherein the carbon is vaporized in step (a) at approximately 100 torr.
181. (New) The solid carbon product of claim 171 wherein the carbon is vaporized in step (a) at a pressure ranging from about 2 to 3 atmospheres.
182. (New) The solid carbon product of claim 171 wherein the collecting substrate in step (b) is a glass surface.
183. (New) The solid carbon product of claim 178 wherein the inert gas is helium or argon.
184. (New) The solid carbon product of claim 171 wherein the non-polar organic solvent of step (d) is carbon disulfide, benzene, carbon tetrachloride or toluene.
185. (New) The solid carbon product of claim 184 wherein the solvent is benzene.
186. (New) The solid carbon product of claim 184 wherein the solvent is carbon tetrachloride.
187. (New) The solid carbon product of claim 171 wherein recovery step (e) comprises evaporating the solvent.
188. (New) A solid carbon product prepared by the process comprising: (a) evaporating a carbon source in the presence of an inert quenching gas under conditions effective to produce a sooty carbon product containing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, said cage molecules being present in said sooty carbon product in

sufficient concentration to allow a macroscopic amount of said cage molecules to be separated from said sooty product;

(b) collecting the sooty carbon product produced therefrom;

(c) subliming the carbon product comprising said cage molecules from the sooty carbon product; and

(d) condensing the sublimed carbon product comprising said cage molecules.

189. (New) The solid carbon product of claim 188, wherein the collecting substrate in step (b), the sooty carbon product is collected on a glass surface.

190. (New) The solid carbon product of claim 188 wherein the sublimation occurs at a temperature ranging from 300°-400° C.

191. (New) The solid carbon product of claim 188 wherein step (c) comprises heating the carbon product comprising said cage molecules in a vacuum or inert atmosphere at effective sublimation temperatures to extract the carbon product comprising said cage molecules from said sooty carbon product.

192. (New) The solid carbon product of claim 188 in which the carbon source in step (a) is vaporized in an evacuated reactor.

193. (New) The solid carbon product of claim 192 in which the carbon in step (a) is vaporized in an evacuated bell jar.

194. (New) The solid carbon product of claim 188 in which the carbon subject to vaporization in step (a) is graphite.

195. (New) The solid carbon product of claim 188 in which the carbon subject to vaporization in step (a) is graphite rods.

196. (New) The solid carbon product of claim 188, wherein the carbon source in step (a) is vaporized by passing an electric current of sufficient intensity to produce a sooty carbon product.
197. (New) The solid carbon product of claim 196, wherein the electrical current is about 100 amps.
198. (New) The solid carbon product of claim 188, wherein the inert quenching gas of step (a) is a noble gas.
199. (New) The solid carbon product of claim 188, wherein the carbon source in step (a) is vaporized at a pressure ranging from 50 torr to 400 torr.
200. (New) The solid carbon product of claim 199, wherein the carbon source is vaporized in step (a) at approximately 100 torr.
201. (New) The solid carbon product of claim 198, wherein the noble gas is helium or argon.
202. (New) A substantially pure fullerene compound comprising a polyhedral carbon cage.
203. (New) The fullerene compound of claim 202, wherein the polyhedral carbon cage contains 60 carbon atoms.
204. (New) The fullerene compound of claim 202, wherein the polyhedral carbon cage contains 70 carbon atoms.
205. (New) The fullerene compound of claim 202, wherein the polyhedral carbon cage contains 240 carbon atoms.
206. (New) The fullerene compound of claim 202, further comprising an atom enclosed within the polyhedral carbon cage.
207. (New) The fullerene compound of claim 206, wherein the enclosed atom is chemically bound to the polyhedral carbon cage.

208. (New) The fullerene compound of claim 206, wherein the enclosed atom is not chemically bound to the polyhedral carbon cage.
209. (New) A pigment comprising a substantially pure fullerene compound comprising a polyhedral carbon cage.
210. (New) A lubricant comprising a substantially pure fullerene compound comprising a polyhedral carbon cage.
211. (New) A molded product comprising a substantially pure fullerene compound comprising a polyhedral carbon cage.
212. (New) The molded product of claim 211, wherein the molded product comprises a fiber comprising a substantially pure fullerene compound comprising a polyhedral carbon cage.
213. (New) A composition comprising the fullerene compound of claim 202.
214. (New) The composition of claim 213, further comprising a non-polar organic solvent.
215. (New) A composition comprising a mixture of at least two substantially purified fullerene compounds each comprising a polyhedral carbon cage.
216. (New) The composition of claim 215 wherein one of said fullerene compounds contains a polyhedral C₆₀ carbon cage.
217. (New) The composition of claim 215 wherein one of said fullerene compounds contains a polyhedral C₇₀ carbon cage.
218. (New) The composition of claim 215 wherein one of said fullerene compounds contains a polyhedral C₂₄₀ carbon cage.
219. (New) A product comprising purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

220. (New) A free-flowing particulate comprising purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.
221. (New) A substantially pure fullerene compound that is soluble in non-polar organic solvents, wherein the compound comprises a polyhedral carbon cage.
222. (New) A substantially pure fullerene compound that is soluble in non-polar organic solvents, wherein the compound comprises a spherical carbon cage.
223. (New) The polyhedral carbon cage of claim 221, wherein the polyhedral carbon cage is an icosahedral carbon cage.
224. (New) The fullerene compound of any one of claims 221-223, wherein the carbon cage contains 60 carbon atoms.
225. (New) The fullerene compound of any one of claims 221-223, wherein the carbon cage contains 70 carbon atoms.
226. (New) The fullerene compound of any one of claims 221-223, wherein the carbon cage contains 240 carbon atoms.
227. (New) The fullerene compound of any one of claims 221-223, further comprising an atom enclosed within the carbon cage.
228. (New) The fullerene compound of claim 227, wherein the enclosed atom is chemically bound to the carbon cage.
229. (New) The fullerene compound of claim 227, wherein the enclosed atom is not chemically bound to the carbon cage.
230. (New) A pigment comprising a substantially pure fullerene compound of any one of claims 221-223.

231. (New) A lubricant comprising a substantially pure fullerene compound of any one of claims 221-223.
232. (New) A molded product comprising a substantially pure fullerene compound of any one of claims 221-223.
233. (New) The molded product of claim 232, wherein the molded product comprises a fiber comprising a substantially pure fullerene compound that is soluble in non-polar organic solvents, wherein the compound comprises a polyhedral carbon cage.
234. (New) A composition comprising the fullerene compound of any one of claims 221-223.
235. (New) A composition comprising a mixture of at least two substantially purified fullerene compounds that are each soluble in non-polar organic solvents, wherein each comprises a fullerene compound of any one of claims 221-223.
236. (New) The composition of claim 235 wherein one of said fullerene compounds comprises a C₆₀ carbon cage.
237. (New) The composition of claim 235 wherein one of said fullerene compounds comprises a C₇₀ carbon cage.
238. (New) The composition of claim 235 wherein one of said fullerene compounds comprises a C₂₄₀ carbon cage.
239. (New) The fullerene compound of claim 202, wherein said polyhedral carbon cage is an icosahedron.
240. (New) The fullerene compound of claim 202, wherein said polyhedral carbon cage has a soccer ball shape.

241. (New) A substantially pure fullerene compound comprising an effectively spherical carbon cage.
242. (New) The purified cage molecules of claim 122, wherein said cage molecules comprise a polyhedral carbon cage.
243. (New) The purified cage molecules of claim 242, wherein said polyhedral carbon cage is an icosahedron.
244. (New) The purified cage molecules of claim 242, wherein said polyhedral carbon cage has a soccer ball shape.
245. (New) The purified cage molecules of claim 122, wherein said cage molecules comprise an effectively spherical carbon cage.